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(72) Самсоненко В.И.; Бойченко В.А.
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(54) СПОСОБ РЕГУЛИРОВАНИЯ ПРОЦЕССА БУРЕНИЯ

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(57)

Signals from the sensor 4 of the mechanical coring, having asynchronous coupling to the UHM, are converted into the form necessary for direct processing and through an interface for communication with the subject are fed to the UHM processor which processes them, taking the earlier established system of priorities into account.

Maintenance of the predetermined design or optimum values of parameters G, n, Q in the process of mechanical drilling is carried out with the aid of LAR 11 and IM 12, to the inputs of which signals are fed which correspond to the necessary values of the parameters G, n, Q.

The UHM processor 7, in accordance with programs realizing the algorithms indicated below for control of the drilling process, sets limits for a change of the drillability of rock formations, the optimum values of the parameters $G_{opt.}$, $n_{opt.}$, $Q_{opt.}$ are determined for each formation of identical drillability, and after a predetermined time for statistic prediction of the moment for raising the bit, the moment for raising the bit for replacement of t_{opt} is determined by statistic prediction, and then its t_{opt} is further defined upon entrance into a new formation of identical drillability.

Prior to the beginning of mechanical drilling, the operator-driller by means of the peripheral devices 8 for information input/output enters the initial data: $\tau_{p.o.}$, L_H, $C_D/C_{p.}$, $t_{int.v.}$, $G^{(H)}$, $n^{(H)}$, $Q^{(H)}$, $G^{(B)}$, $n^{(B)}$, $Q^{(B)}$, into the UHM memory 7.

The design values of the parameters G_{design}, n_{design}, Q_{design} are entered into the UHM memory from the UHM controllers 1, 2, 3 or by means of the peripheral input/output devices in the case of direct digital control. All the entered values are registered with the aid of the devices 8.

The b_0, b_1, b_2 coefficients of the interpolation relationship $t = f(G,n,Q)$ were preliminarily obtained after processing the results of a planned fractional industrial experiment, carried out in a similar formation member. A linear relationship is obtained upon realization of the fractional industrial experiment, selected in order to reduce the number of experiments with average intervals of variation of the parameters G, n, Q.

The obtained optimum values of the parameters $G_{opt\ 1}$, $n_{opt\ 1}$, $Q_{opt\ 1}$ are compared with current values of corresponding parameters, which with the aid of LAR are maintained constant (for the first interval of identical drillability equal to the design value, and for the next interval equal to the optimum values in the preceding interval) and in the case of the presence of disagreement between them, control signals are developed.

A change of the design (current) settings for the drilling mode parameters G, n, Q to the optimum values inevitably has an effect on the value of the rate of penetration $V_{s.k.}$, and consequently results in an abrupt change of $V_t = f(t)$ in the first formation of identical drillability (see Fig. 2). Further drilling in the first formation of identical drillability is carried out with optimum values of $G_{opt\,1}$, $n_{opt\,1}$, $Q_{opt\,1}$.